EXHIBIT A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
(Attorney Docket No. 08-880-US7)

In re the Application of:	)	
	)	
David C. Gelvin et al.	)	Examiner: Imad Hussain
	)	
Serial No.: 09/684,387	)	Confirmation No.: 9822
	)	
Filed: October 4, 2000	)	Art Unit: 2451
	)	
For: Apparatus for Compact Internetworked Wireless Integrated Network Sensors (WINS)	)	

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Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313

RESPONSE TO EX PARTE QUAYLE ACTION MAILED APRIL 16, 2010
SUBMITTED UNDER 37 C.F.R. § 1.114

Dear Sir:

In response to the *Ex parte Quayle* action mailed April 16, 2010, Applicant submits the following amendments and remarks with a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114.

Amendments to the specification begin on page 2 of this paper.

Amendments to the claims begin on page 3 of this paper.

Remarks begin on page 15 of this paper.

The Patent Office is hereby authorized to charge any required fee(s) or credit any overpayment to Deposit Account No. 132490, and to treat any communication in this matter that requires an extension of time as incorporating a request for such an extension.

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

AMENDMENTS TO THE SPECIFICATION

Please amend the paragraph starting on page 1, line 5 as follows:

This application claims the benefit of United States Provisional Application Number 60/158,013, filed October 06, 1999, United States Provisional Application Number 60/170,865, filed December 15, 1999, United States Provisional Application Number 60/208,397, filed May 30, 2000, United States Provisional Application Number 60/210,296, filed June 08, 2000, United States Patent Application Number 09/684,706 ~~(to be assigned reference number 21200.702)~~, filed October 04, 2000, now pending, United States Patent Application Number 09/684,565 ~~(to be assigned reference number 21200.706)~~, filed October 04, 2000, now United States Patent Number 7,072,701, issued March 28, 2006, United States Patent Application Number 09/685,020 ~~(to be assigned reference number 21200.707)~~, filed October 04, 2000, now United Stated Patent Number 6,832,251, issued December 14, 2004, United States Patent Application Number 09/685,019 ~~(to be assigned reference number 21200.708)~~, filed October 04, 2000, now United States Patent Number 6,826,607, issued November 30, 2004, United States Patent Application Number 09/684,490 ~~(to be assigned reference number 21200.710)~~, filed October 04,2000, now United States Patent Number 7,484,008, issued January 27, 2009, United States Patent Application Number 09/684,742 ~~(to be assigned reference number 21200.711)~~, filed October 04, 2000, now pending, United States Patent Application Number 09/680,550 ~~(to be assigned reference number 21200.712)~~, filed October 04, 2000, now United States Patent Number 6,735,630, issued May 11, 2004, United States Patent Application Number 09/685,018 ~~(to be assigned reference number 21200.713)~~, filed October 04, 2000, now United States Patent Number 6,859,831, issued February 22, 2005, United States Patent Application Number 09/684,388 ~~(to be assigned reference number 21200.714)~~, filed October 04,2000, now pending, United States Patent Application Number 09/684,162 ~~(to be assigned reference number 21200.715)~~, filed October 04, 2000, now inactive, and United States Patent Application Number 09/680,608 ~~(to be assigned reference number 21200.716)~~, filed October 04,2000, now pending, all of which are incorporated by reference.

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

AMENDMENTS TO THE CLAIMS

Claim 1. (Currently Amended) A sensor node comprising:

at least one processor;

at least one energy source;

a multiple-mode radio frequency modem ~~operable~~ configured to selectively operate in [[both]] at least a master mode and a slave mode, wherein the modem ~~operates~~ is configured to operate in the master mode [[when]] in response to the sensor node [[has]] having a number of connections to neighbor nodes of the sensor node that exceeds a respective number of connections that each of the neighbor nodes ~~of the sensor node~~ has to its own neighbor nodes by a threshold number of connections, wherein ~~while the modem operates in the master mode,~~ the sensor node is configured to control a frequency hopping pattern for each neighbor node of the sensor node in response to the modem operating in the master mode,

wherein the modem ~~operates~~ is configured to operate in the slave mode [[when]] in response to a neighbor node of the sensor node [[has]] having a number of neighbor node connections that exceeds the number of connections to neighbor nodes of the sensor node by the threshold number of connections, and wherein ~~while the modem operates in the slave mode,~~ the sensor node is configured to acquire and follow a frequency hopping pattern of a neighbor node of the sensor node that operates as a master to the sensor node in response to the modem operating in the slave mode; and

at least one substrate ~~coupled among~~ configured to couple the at least one processor, the at least one energy source, and the multiple-mode radio frequency modem,

wherein the at least one substrate comprises at least one sensor.

Claim 2. (Original) The sensor node of claim 1, wherein the at least one substrate comprises active and passive substrates.

Claim 3. (Previously presented) The sensor node of claim 2,

wherein the at least one substrate comprises at least one thin film substrate,

wherein the at least one thin film substrate comprises a piezoelectric polymer film, and

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

wherein the piezoelectric polymer film is polyvinylidenedifloride (PVF_2).

Claim 4. (Original) The sensor node of claim 1, wherein the at least one substrate is conformal.

Claims 5-8. (Canceled)

Claim 9. (Previously presented) The sensor node of claim 1, further comprising at least one communication physical layer including radio frequency (RF) power management.

Claim 10. (Currently amended) The sensor node of claim 1, wherein the at least one processor is configured to be coupled to at least one component selected from [[a]] the group consisting of actuators, sensors, signal processors, interfaces, power supplies, data storage devices, and communication devices.

Claim 11. (Currently amended) The sensor node of claim 1, wherein the at least one sensor comprises at least one sensor selected from [[a]] the group consisting of passive sensors, active sensors, seismic sensors, acoustic sensors, optical sensors, infrared sensors, magnetic sensors, thermal sensors, accelerometers, and bi-static sensors.

Claim 12. (Previously presented) The sensor node of claim 1,

wherein the at least one energy source includes a thin film photovoltaic device, and

wherein the thin film photovoltaic device comprises an energy source and an optical presence detection sensor.

Claim 13. (Currently amended) The sensor node of claim 1, wherein the sensor node is configured to be coupled to at least one item selected from [[a]] the group consisting of machinery components, electronic equipment, mechanical equipment, electro-mechanical equipment, a facility, a structure, a material, a biological system, people, animals, vegetation,

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

clothing, crates, packages, product containers, shipping containers, a transportation system, vehicle components, an outdoor area, and an indoor area.

Claim 14. (Currently amended) The sensor node of claim 1, wherein the at least one sensor is ~~operable~~ configured to receive at least one signal type selected from [[a]] the group consisting of temperature, shock, vibration, motion, acceleration, tip, light, sound, and package opening and closing.

Claim 15. (Canceled)

Claim 16. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node,

wherein the at least one node is configured to be coupled ~~among~~ to a monitored environment and at least one client computer,

wherein ~~functions of~~ the at least one node is configured to be ~~are~~ remotely ~~controllable~~ controlled from ~~using~~ the at least one client computer,

wherein the at least one node is configured to provide node information including node resource cost and message priority to the plurality of network elements, and

wherein data processing is distributed through the sensor network in response to the node information.

Claim 17. (Canceled)

Claim 18. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node and at least one client computer,

wherein the sensor node is configured to be coupled to the at least one client computer through the plurality of network elements,

wherein the at least one node is configured to support at least one communication mode

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

selected from [[a]] the group consisting of wireless communications, wired communications, and hybrid wired and wireless communications, and

wherein at least one redundant communication pathway is established among the plurality of network elements.

Claim 19. (Canceled)

Claim 20. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises at least one network,

wherein the at least one network includes a network selected from the group consisting of a wired network, a wireless network, and a hybrid wired and wireless network~~, and~~

~~wherein the at least one network comprises at least one network selected from a group consisting of the Internet, a local area network, a wide area network, a metropolitan area network, and an information service station~~.

Claim 21. (Currently amended) The sensor node of claim 56,

wherein the wireless internetworking comprises providing remote accessibility ~~using World Wide Web based tools~~ to data, code, management, and security functions,

wherein the data includes signals and images,

wherein the code includes signal processing, decision support, and database elements, and

wherein the management includes operation of the plurality of network elements.

Claim 22. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises a layered plurality of network element sets ~~that are layered~~.

Claim 23. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node,

wherein the at least one node includes at least one node of a first type and at least one node of a second type,

wherein a first network ~~having a first node density~~ is configured to be assembled using the at least one node of [[a]] the first type,

wherein a second network ~~having a second node density~~ is configured to be assembled using the at least one node of [[a]] the second type, and

wherein the second network ~~is overlayed onto~~ overlays the first network.

Claim 24. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network,

wherein at least some of the code and data ~~anticipated for future use~~ are predistributed through the sensor network using low priority messages, and

wherein the code and the data are downloadable from at least one location selected from [[a]] the group consisting of storage devices of the plurality of network elements, and storage devices outside the sensor network.

Claims 25-26. (Canceled)

Claim 27. (Currently amended) The sensor node of claim [[56]] 1, ~~wherein data processing is controlled using~~ further comprising:

at least one processing hierarchy configured to control ~~, and wherein the at least one processing hierarchy controls~~ at least one event selected from [[a]] the group consisting of data classifications, data transfers, data queuing, data combining, processing locations, and communications among the plurality of network elements.

Claim 28. (Currently amended) The sensor node of claim 1 [[56]],

wherein data is transferred using message packets,

wherein the message packets are aggregated into compact forms ~~in the plurality of network elements~~ using message aggregation protocols, and

wherein the message aggregation protocols are adaptive to data type, node density,

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

message priority, and available energy.

Claim 29. (Previously presented) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node, and

wherein the functions of the at least one node include data acquisition, data processing, communication, data routing, data security, programming, and node operation.

Claim 30. (Previously presented) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node,

wherein the at least one node includes an application programming interface (API),

wherein the API is configured to support remote reprogramming and control of at least one device selected from the group consisting of sensors, actuators, communications devices, signal processors, information storage devices, node controllers, and power supply devices.

Claim 31. (Currently amended) The sensor node of claim 30,

wherein the API is ~~plurality of APIs are~~ configured to enable distributed resource management by providing network resource information and message priority information to the plurality of network elements, and wherein ~~information transfer among the plurality of network elements is controlled using~~ a synchronism hierarchy established in response to the resource information and message priority information is configured to control information transfer among the plurality of network elements.

Claim 32. (Previously presented) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node, and

wherein the at least one node is configured to control data processing and data transmission in response to a probability of a detected event.

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

Claim 33. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node,

~~wherein the plurality of network elements are configured to self-assemble,~~

wherein search and acquisition modes of the at least one node are configured to search for participating ones of the plurality of network elements,

wherein a determination is made whether each of the participating ones of the plurality of network elements are permitted to join the sensor network using a message hierarchy, and

wherein the sensor network is configured to be surveyed at random intervals for new nodes and missing nodes.

Claim 34. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node,

wherein the plurality of network elements further includes at least one database, wherein the at least one database includes at least one storage device selected from [[a]] the group consisting of storage devices coupled to at least one of the plurality of network elements and storage devices of the at least one node, and

wherein the at least one database comprises data-driven alerting methods ~~that~~ to recognize ~~conditions on user-defined~~ data relationships including coincidence in signal arrival, node power status, and network communication status.

Claim 35. (Currently amended) The sensor node of claim 56,

wherein the plurality of network elements comprises a sensor network including at least one node,

wherein ~~data is collected from the sensor node by~~ the at least one node is configured to collect data from the sensor node,

wherein at least one operation is performed on the data in response to established parameters ~~established by a user~~,

wherein the at least one operation is selected from [[a]] the group consisting of energy

detection, routing, processing, storing, and fusing, and

wherein the routing, processing, storing, and fusing are performed in response to at least one result of the energy detection.

Claim 36. (Currently amended) The sensor node of claim 35,

wherein the routing comprises selecting at least one data type for routing, selecting at least one of the plurality of network elements to which to route the selected at least one data type, selecting at least one route to the selected at least one of the plurality of network elements, and routing the selected at least one data type to the selected at least one of the plurality of network elements.

Claim 37. (Currently amended) The sensor node of claim 35,

wherein the processing comprises selecting at least one data type for processing, selecting at least one processing type, selecting at least one of the plurality of network elements to perform the selected at least one processing type, and transferring the selected at least one data type to the selected at least one of the plurality of network elements using at least one route ~~through the sensor network~~, and

wherein the selection of at least one processing type comprises determining at least one probability associated with a detected event and selecting at least one processing type in response to the at least one probability.

Claim 38. (Currently amended) The sensor node of claim 35,

wherein the storing comprises selecting at least one data type for storage, selecting at least one storage type, selecting at least one of the plurality of network elements to perform the selected at least one storage type, and transferring the selected at least one data type to the selected at least one of the plurality of network elements using at least one route ~~through the sensor network~~.

Claim 39. (Canceled)

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

Claim 40. (Previously presented) The sensor node of claim 56,

wherein at least one of the plurality of network elements is configured to determine a position of the sensor node.

Claim 41. (Previously presented) The sensor node of claim 56,

wherein the sensor node is configured to determine at least one position using location information received from at least one of the plurality of network elements.

Claim 42. (Canceled)

Claim 43. (Previously presented) The sensor node of claim 1,

wherein the at least one substrate comprises a thin film tape, and

wherein the thin film tape includes an adhesive.

Claim 44. (Canceled)

Claim 45. (Previously presented) The sensor node of claim 1, wherein the at least one substrate is configured to operate as an acoustic sensor and source.

Claim 46. (Currently amended) The sensor node of claim 1, wherein the at least one substrate comprises ~~a material suitable for unrolling as a~~ sensor tape material ~~to different lengths~~.

Claim 47. (Previously presented) The sensor node of claim 1, wherein the at least one energy source is a photovoltaic device incorporated in or mounted on the at least one substrate.

Claim 48. (Previously presented) The sensor node of claim 1, wherein the at least one substrate is configured to operate as a vibration and acoustic sensor.

Claim 49. (Previously presented) The sensor node of claim 1,

wherein the at least one substrate is configured to operate as an accelerometer; and

wherein the at least one energy source comprises one or more battery cells that are configured to serve as proof masses for the accelerometer.

Claim 50. (Currently amended) A sensor node comprising:

a flexible substrate configured to operate as an acoustic sensor and an acoustic source;

a processor incorporated in or mounted on the flexible substrate, wherein the processor is configured to automatically join ~~another~~ at least one other node to form a network; and

an antenna, incorporated in or carried on the flexible substrate, configured to be [[and]] electrically coupled to the processor for wireless communication ~~with the other node~~,

wherein the acoustic sensor is configured to determine a position of the sensor node,

wherein the sensor node is configured to communicate information identifying the determined position of the sensor node to the other node,

wherein the sensor node is configured to synchronize with the at least one other node via radio frequency communications, and

wherein synchronization of the sensor node and the at least one other node allows the sensor node to compensate for wind when determining a range of the sensor node.

Claim 51. (Previously presented) The sensor node of claim 50, wherein the flexible substrate is configured to operate as a sensor in an accelerometer.

Claim 52. (Currently amended) The sensor node of claim 50,

further comprising a photovoltaic device incorporated in or mounted on the flexible substrate,

wherein the photovoltaic device is configured to be ~~electrically coupled to provide~~ an energy source for ~~operation of~~ the processor.

Claim 53. (Currently amended) The sensor node of claim 50, wherein the flexible substrate ~~has~~ is configured with an aerodynamic shape ~~suitable for deployment by air~~.

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

Claims 54-55. (Cancelled)

Claim 56. (Previously presented) The sensor node of claim 1, wherein functions of the sensor node are remotely controllable and the sensor node is programmable via wireless internetworking among a plurality of network elements.

Claim 57. (Currently amended) The sensor node of claim 50,

wherein the formed network includes a gateway node configured to link ~~that links~~ to ~~another~~ at least one other network, and

wherein the at least one other network comprises the Internet.

Claim 58. (Currently amended) The sensor node of claim 50,

wherein the formed network includes a gateway node that is linkable to ~~another~~ at least one other network,

wherein the at least one other network comprises a client device, and

wherein the sensor node is programmable by the client device.

Claim 59. (Currently amended) The sensor node of claim 50, wherein the network is ~~operable~~ configured to detect a second sensor node~~, wherein the second sensor node is~~ configured to be attached ~~to a person or to a vehicle~~.

Claim 60. (Currently amended) The sensor node of claim 50,

wherein the flexible substrate comprises a flexible support material and a layer of polyvinylidenedifloride that is applied to the flexible support material, and

wherein the layer of polyvinylidenedifloride is ~~operable~~ configured to operate as the acoustic sensor and an acoustic source.

Claims 61-62. (Cancelled)

Claim 63. (Previously presented) The sensor node of claim 1, wherein the at

least one sensor comprises at least one bi-static sensor.

Claim 64. (Currently amended) The sensor node of claim 1,

wherein ~~when~~ in response to the modem ~~operates~~ operating in the slave mode, the sensor node is ~~operable~~ configured to join two clusters of nodes, and

wherein each of the two clusters of nodes comprises a respective neighbor node that operates as a master to the sensor node.

Claim 65. (Currently amended) The sensor node of claim 1,

wherein the sensor node is configured to be coupled to a package, and

wherein the at least one sensor is ~~operable~~ configured to sense opening and closing of the package.

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002

REMARKS

1. Summary of the *Ex parte Quayle* Action

The *Ex parte Quayle* Action mailed April 16, 2010 objected to the specification. Specifically, the Examiner objected to informalities related to references of "to be assigned-reference numbers." *Ex parte Quayle* Action, page 3.

2. Summary of the Response

In response, Applicant has amended the specification as requested by the Examiner to recite an application serial number for each related application previously identified in the specification by attorney-assigned reference numbers. For related issued applications, the specification is amended to recite the corresponding application patent numbers and issue dates.

Applicant has amended claims 1, 10, 11, 13, 14, 16, 18, 20-24, 27-28, 31, 33-38, 46, 50, 52, 53, 57-60, and 64-65 to clarify the language of the claims and/or correct minor errors in the claims. These amendments are generally supported by the application.

This response is filed with an RCE, and Applicant respectfully requests the Examiner consider the concurrently-filed Information Disclosure Statement (IDS).

3. Conclusion

Applicant respectfully requests the Examiner to consider and enter these amendments. The Examiner is invited to call the undersigned at (312) 913-3338 as needed to expedite prosecution of this application.

Respectfully submitted,

McDONNELL BOEHNEN HULBERT & BERGHOFF LLP

Date: May 20, 2010

By: /Thomas J. Loos/
Thomas J. Loos
Reg. No. 60,161

McDonnell Boehnen Hulbert & Berghoff LLP
300 South Wacker Drive
Chicago, Illinois 60606
Telephone: (312) 913-0001
Facsimile: (312) 913-0002